

What is claimed is:

1. An overflow protection device comprising:
a valve body having a gas conduit extending through the valve body, the gas conduit
5 comprising a conduit inlet opening for introducing pressurized gas, a conduit outlet
opening for permitting the pressurized gas to exit, and a valve chamber between the
conduit inlet opening and the conduit outlet opening;
a valve within the valve opening and being mounted for movement from a closed position
preventing pressurized gas from passing from the conduit inlet opening to the
10 conduit outlet opening to an open position permitting pressurized gas to pass from
the conduit inlet opening to the conduit outlet opening;
the valve being biased to the closed position by the pressure of the pressurized gas from the
conduit inlet opening;
a float movably mounted to the valve body;
15 a cam associated with the float and being movable in response to movement of the float
between a full position and a less than full position;
an actuator mounted for movement within the valve body and being in engagement with
the cam, the actuator being movable in response to movement of the float to the less
than full position to engage the valve and hold the valve in the open position and
20 being movable in response to the movement of the float to the full position to
withdraw from the valve and permit the valve to move to the closed position.
2. The overflow protection device according to claim 1 and further comprising a valve
retainer within the valve opening and in engagement with the valve, the valve retainer
25 being positioned between the valve and the conduit inlet opening of the valve body.
3. The overflow protection device according to claim 2 wherein the valve retainer
includes a valve cavity partially surrounding the valve.

4. The overflow protection device according to claim 3 wherein the valve retainer includes four sides surrounding the valve cavity, a first two of the four sides being adjacent one another and having a first length, a second two of the four sides being adjacent one another and having a second length less than the first length.

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5. The overflow protection device according to claim 4 wherein at least one of the first two of the four sides includes a lower edge having a notch formed therein.

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6. The overflow protection device according to claim 3 wherein the valve cavity is partially spherical in shape and the valve is a ball.

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7. The overflow protection device according to claim 1 wherein the valve chamber includes a valve seat, the valve being seated on the valve seat when the valve is in the closed position and being spaced from the valve seat when the valve is in the open position.

8. The overflow protection device according to claim 1 wherein the actuator comprises a pin and the valve body includes a pin bore loosely housing the pin.

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9. The overflow protection device according to claim 8 wherein the pin includes an upper end, the upper end being within at least a portion of the conduit between the valve and the conduit outlet opening.

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10. The overflow protection device according to claim 1 wherein the float and the cam are rigid with respect to one another so that the cam moves in unison with the float.

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11. The overflow protection device according to claim 10 wherein the cam includes a first cam surface engaging the actuator during the time that the actuator holds the valve in the open position and includes a second cam surface engaging the actuator during the time that the actuator permits the valve to move to the closed position.

12. The overflow protection device according to claim 10 wherein the cam and float are pivotally mounted to the valve body.

13. In combination:

- 5 a pressurized gas tank having a gas chamber for receiving pressurized gas that takes the form of liquid when within the gas chamber, the gas chamber having a gas inlet opening for introducing pressurized gas to the gas chamber;
- a valve body having a gas conduit in communication with the gas inlet opening and extending through the valve body, the gas conduit comprising a conduit inlet
- 10 opening in communication with the gas inlet opening, a conduit outlet opening for permitting the pressurized gas to enter the gas chamber, and a valve chamber between the conduit inlet opening and the conduit outlet opening;
- a valve within the valve chamber and being mounted for movement from a closed position preventing the pressurized gas from passing from the conduit inlet opening to the
- 15 conduit outlet opening to an open position permitting the pressurized gas to pass from the conduit inlet opening to the conduit outlet opening;
- the valve being biased to the closed position by the pressure of the pressurized gas from the gas inlet opening of the tank ;
- a float movably mounted to the valve body;
- 20 a cam associated with the float and being movable in response to movement of the float between a full position and a less than full position;
- an actuator mounted for movement within the valve body and being in engagement with the cam, the actuator being movable in response to the cam to the less than full position to engage the valve and hold the valve in the open position and being
- 25 movable in response to the cam to the full position to withdraw from the valve and permit the valve to move to the closed position.

14. The combination of claim 13 wherein the float is positioned to float on the upper surface of the liquid within the gas chamber, and being movable in response to the rise of

30 the upper surface of the liquid to the full position when the upper surface of the liquid within the gas chamber reaches a predetermined maximum level within the gas chamber.

15. The combination of claim 14 wherein the cam is affixed to the float and causes the actuator to permit the valve to move to the closed position whenever the upper surface of the fluid is at the predetermined maximum level.

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16. The method of preventing the overfilling of a pressurized gas tank having a gas inlet opening providing communication into a gas chamber within the tank for the introduction of pressurized gas in a liquid state, the method comprising:

connecting a valve body within the gas chamber to the gas inlet opening, the valve body

10 including a conduit comprising a conduit inlet opening in communication with the gas inlet opening, a conduit outlet opening for introducing the pressurized gas into the gas chamber, and a valve chamber between the conduit inlet opening and the conduit outlet opening;

positioning a valve in the valve chamber, the valve being movable from an open position

15 permitting the pressurized gas to flow from the conduit inlet opening through the conduit outlet opening to a closed position preventing the pressurized gas from flowing from the conduit inlet opening to the conduit outlet opening;

mounting a float to the valve body for movement from a less than full position to a full position, the float having a cam surface thereon;

20 engaging an actuator with the cam surface, the actuator having a first end engaging the cam surface and a second end positioned adjacent the valve;

moving the actuator to engage the valve and hold the valve in the open position in response to movement of the float and the cam to the less than full position;

25 moving the actuator to withdraw from engagement with the valve so as to permit the valve to move to the closed position in response to movement of the float and cam to the full position; and

biasing the valve to the closed position.

17. The method according to claim 16 wherein the step of biasing the valve is

30 accomplished by the pressure of the pressurized fluid entering the valve chamber and acting upon the valve.

18. The method according to claim 17 wherein a retainer at least partially surrounds the valve.
- 5 19. The method according to claim 16 wherein the actuator comprises a pin having a lower pin end engaging the cam surface and an upper pin end, the method further comprising moving the pin so that the upper pin end engages the valve in response to the movement of the float to the less than full position.